

CLAIMS

1. An electromagnetic transducer comprising:
a first diaphragm;
5 a second diaphragm provided in a central portion of
the first diaphragm, the second diaphragm comprising a
magnetic material having a first opening in a central
portion thereof;
a yoke disposed so as to oppose the first diaphragm;
10 a center pole disposed between the yoke and the first
diaphragm, wherein the center pole has a shape which
allows insertion into the first opening;
a coil disposed so as to surround the center pole;
and
15 a first magnet disposed so as to surround the coil.
2. An electromagnetic transducer according to claim 1,
wherein the first diaphragm has a second opening in which
the center pole can be inserted.
- 20 3. An electromagnetic transducer according to claim 1,
wherein an upper face of the center pole is level with
or higher than a lower face of the second diaphragm.
- 25 4. An electromagnetic transducer according to claim 1,
further comprising a first thin magnetic plate disposed
between the first magnet and the first diaphragm.
5. An electromagnetic transducer according to claim 1,
30 wherein the center pole has a diameter which varies along
a height direction thereof.
6. An electromagnetic transducer according to claim 5,

FOUETT 52E03650

wherein the diameter of the center pole varies in such a manner as to represent a quadratic curve with respect to the height of the center pole.

- 5 7. An electromagnetic transducer according to claim 1,
 wherein the second diaphragm has a larger thickness at
 an inner periphery than at an outer periphery thereof.
- 10 8. An electromagnetic transducer according to claim 1,
 wherein the second diaphragm is turned up or down at an
 inner periphery thereof so as to have a substantially
 L-shaped cross section.
- 15 9. An electromagnetic transducer according to claim 1,
 further comprising a cover for covering the first opening
 in the second diaphragm.
- 20 10. An electromagnetic transducer according to claim 9,
 wherein the cover is integral with the first diaphragm.
11. An electromagnetic transducer according to claim 1,
 further comprising a second magnet provided so as to be
 on an opposite side of the second diaphragm from the yoke.
- 25 12. An electromagnetic transducer according to claim 11,
 further comprising a second thin magnetic plate provided
 so as to be an opposite side of the second magnet from
 the yoke.
- 30 13. An electromagnetic transducer according to claim 1,
 further comprising a first housing for supporting the
 first diaphragm.

FOOTSEEK 52E03660

14. An electromagnetic transducer according to claim 11, further comprising a second housing for supporting the second magnet.

5 15. A portable communication device comprising an electromagnetic transducer according to any one of claims 1 to 14.

10 16. A portable communication device according to claim 15, further comprising an antenna for receiving radiowaves and a transmission/reception circuit for converting the radiowaves into a voice signal, wherein the electromagnetic transducer reproduces the voice signal.

TOOET" SEEB660